2.4a Average Rate of Change

Estimate the velocity at t=3 using the data

ave velocity = Δdistance/Δtime

right hand difference quotient (rhdq)

need 2 pts

$\frac{1.431-1.491}{3.1-3.0} = -.6 \frac{m}{s}$

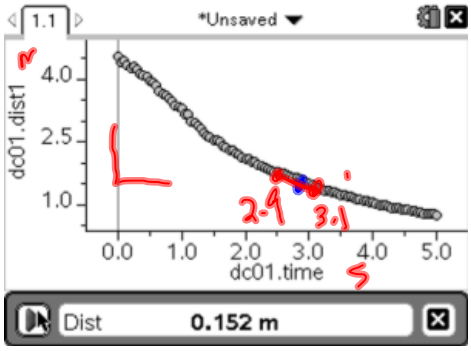
left hand difference quotient (lhdq)

$\frac{1.491-1.566}{3.0-2.9} = -.75 \frac{m}{s}$

symmetric difference quotient (sdq)

$\frac{1.431-1.566}{3.1-2.9} = -.675 \frac{m}{s}$

(2.9, 1.566) (3.0, 1.491) (3.1, 1.431)



Nick's walk

Nick walke quickly at first then slowly at the end

velocity changed

Aug 24-9:22 AM

Use a quadratic regression curve to estimate the velocity at t=3

right hand difference quotient

left hand difference quotient

symmetric difference quotient

↑ trace on the graph of the quadratic equation

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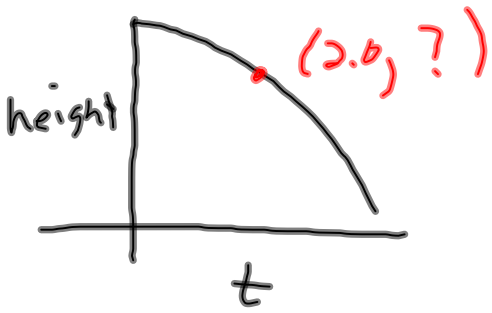
A ball is dropped from the top of a 50 ft tower. Its height above ground after t seconds is $50-16t^2$ How fast is it falling after 2 seconds?



$f1(x)=50-16x^2$

sdq:

$$\frac{f1(2.1)-f1(1.9)}{2.1-1.9}$$

$$=-64\ \frac{ft}{sec}$$

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The table shows the coordinates of a moving body. Estimate the velocity at t=2.5.

t sec	0	.5	1	1.5	2	2.5	3	3.5	4
s (ft)	3.5	-4	-8.5	-10	-8.5	-4	3.5	14	27.5

Use the data:

$$\frac{3.5-(-8.5)}{3-2}=12\ \frac{ft}{sec}$$

Use a regression curve.

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